

APPENDIX C-4

WATER MANAGEMENT PLAN

OPERATOR: Petroleum Development Corporation (PEDCO)

Sun Dog Pod
Carbon County, Wyoming

The Sun Dog Pod is 1 of 9 pods that comprise the Atlantic Rim Coalbed Methane Interim Drilling Project. The Sun Dog Pod consists of 10 gas wells and related water disposal wells. This Water Management Plan will address 6 of the 10 planned interim development wells located in T16N,R91W Section 17. The remaining 4 gas wells located in T16N,91W Sec.8:S2 were previously addressed under the Dry Cow Pod Water Management Plan. Water injection wells will be used to dispose of water produced during testing and production of methane gas.

Before the injection wells are drilled and completed, water produced from CBM wells may be transported to nearby drilling locations and used to drill additional wells. Any produced water will be contained in the drilling reserve pit constructed on each well pad until the injection wells are completed. Once all wells have been drilled, water produced at the exploratory well sites would be gathered and transported to the injection wells for disposal, which would be permitted by all necessary agencies.

See attached diagrams of **typical injection well, water transfer facility and water disposal facility**.

The injection well will be drilled, cased, cemented to surface and the Cherokee and/or Deep Creek sands will be tested to determine their suitability for water disposal. The estimated depths of these formations are 3200' and 3400' respectively.

Typically, a single injection well would be used for several gas wells. The number of producing gas wells per injection well will depend on the suitability of the Cherokee and Deep Creek sands and the amount of produced water from each gas well.

The source of the water to be disposed will be from the coal formations of the Mesaverde Group. Water will be transported from each gas well to the injection well by buried 2" poly pipe. Transfer pumping stations may need to be utilized in areas where elevation differences require supplemental pumping to transfer the produced water. A typical water transfer facility consists of a 400 bbl water tank with associated pump and piping.

Locations of water transfer facilities will be submitted via Sundry Notice.

To keep surface damage to a minimum, ditches will combine as many pipelines as possible (i.e., water, electricity, gas).

A typical water injection facility will consist of four – 400 bbl water tanks, pump house, piping, and well house for the disposal well.

Both the Cherokee and Deep Creek formations are isolated above and below by competent shale barriers. These shales will prevent the initiation and propagation of fractures through overlying strata to any fresh water zones.

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PEDCO hereby certifies that:

1. All potentially affected landowners having properly permitted water wells with the Wyoming State Engineer's Office within each proposed well's Circle of Influence (one-half mile radius) were offered a Water Well Agreement; and
2. If a Water Well Agreement is not reached with the landowner, PEDCO agrees to mitigate the impacts of its coalbed methane wells in accordance with State of Wyoming water laws; and
3. Pedco has applied for a Permit to Appropriate Groundwater from the Wyoming State Engineer's Office, concurrently with the Applications for Permit to Drill.

Lessees Representation and Certification – Sun Dog Pod

Mr. Scott Hedlund

Compliance Technician

PEDCO

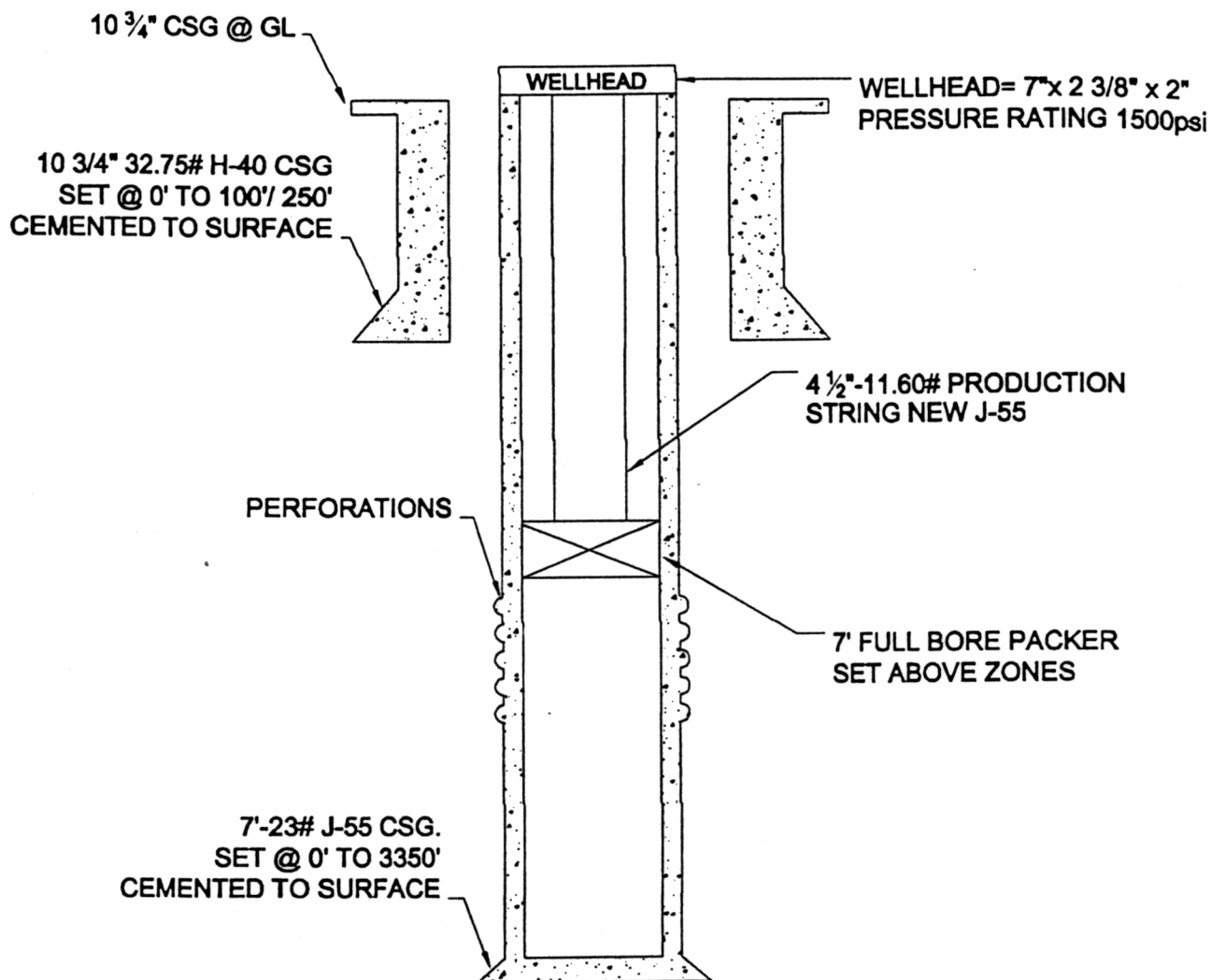
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Gillette, WY 82716

(307) 682-4088

PEDCO:

Date: August 21, 2001



PETROLIUM DEVELOPMENT CORP.



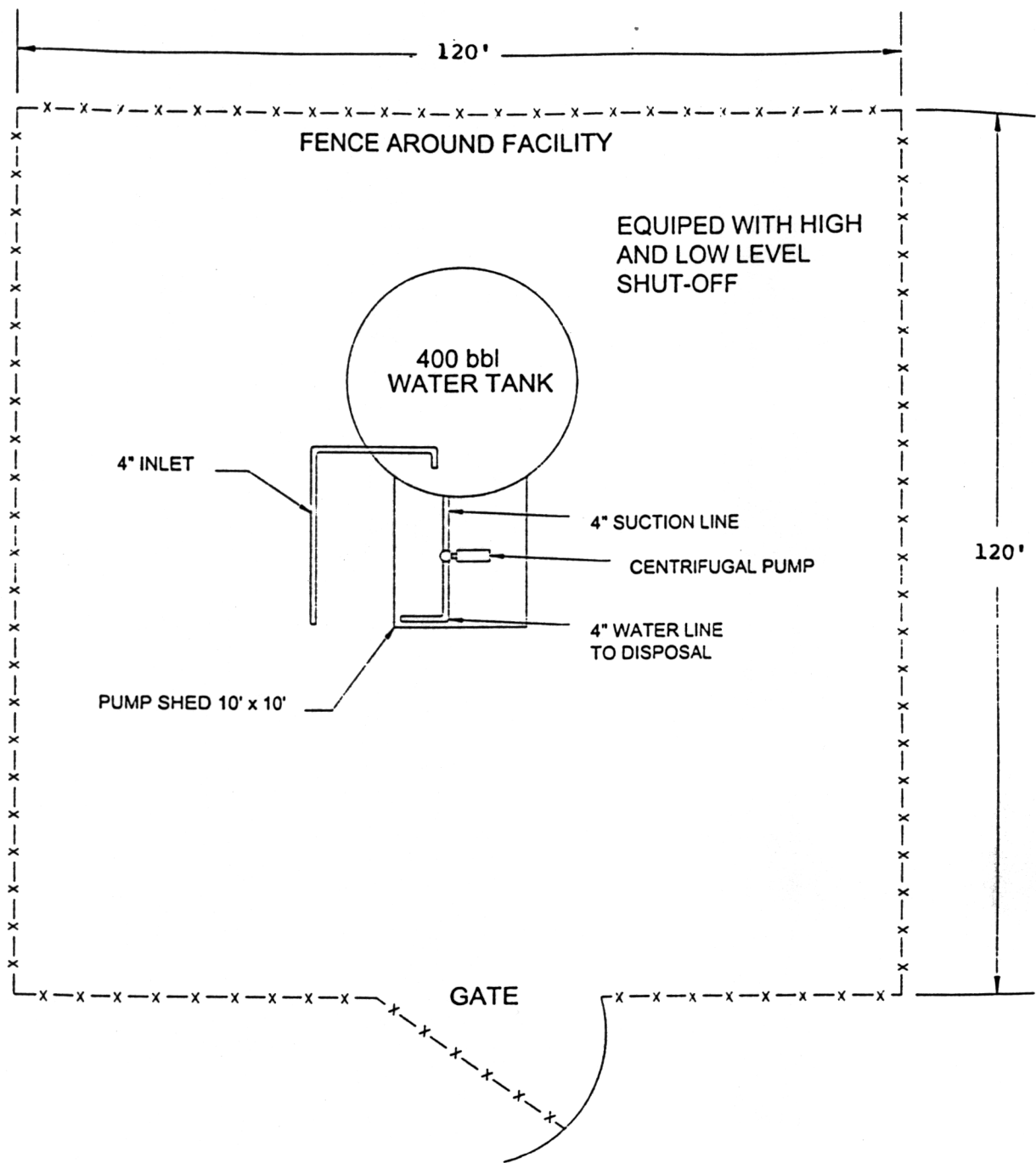
INJECTION WELL

SCALE: NTS

DATE: 05.04.01

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FIGURE: 7



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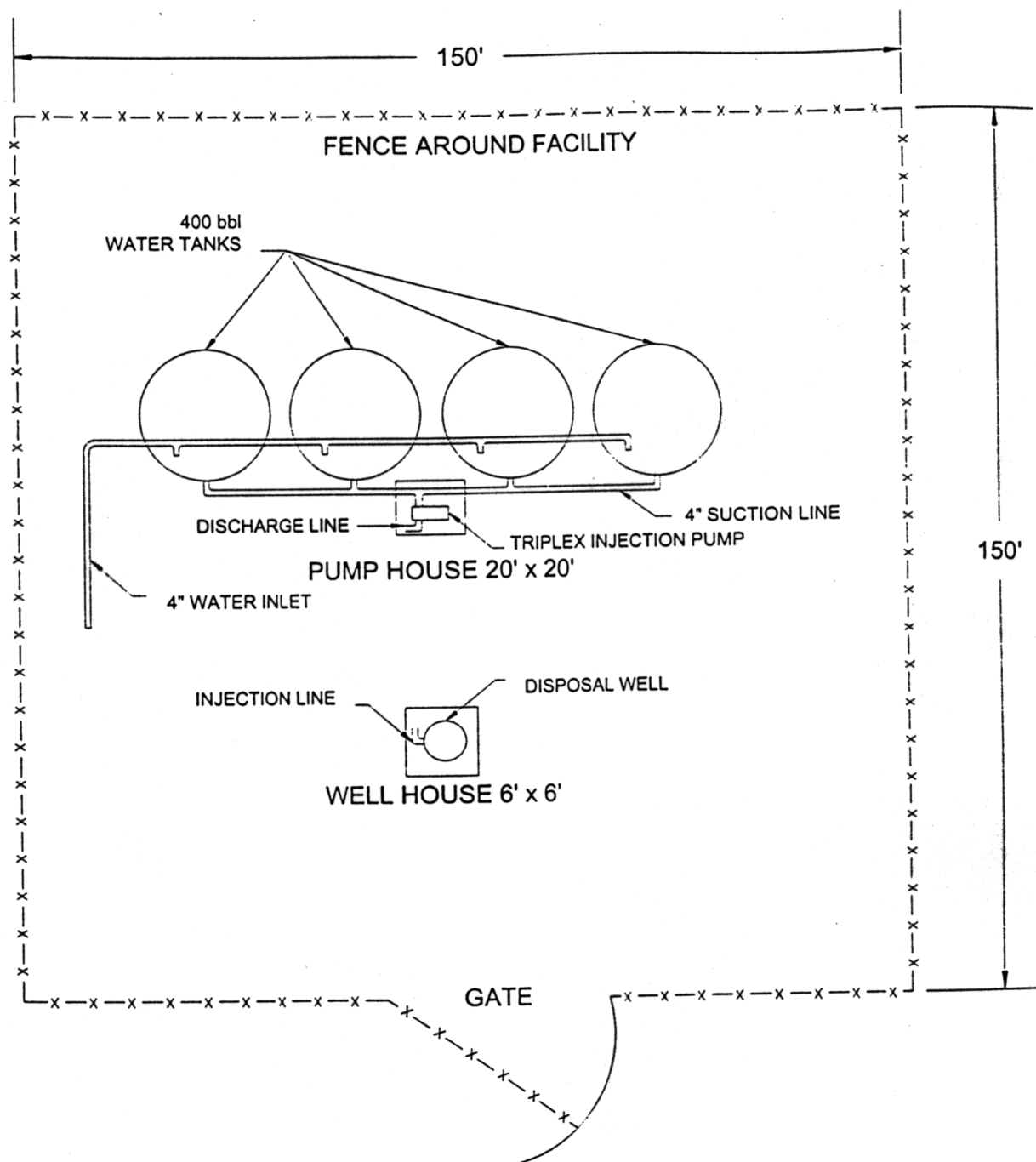
TYPICAL WATER TRANSFER FACILITY

SCALE: NTS

DATE: 05.04.01

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FIGURE: 9



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TYPICAL WATER DISPOSAL FACILITY

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FIGURE: 8